CLAIMS

That which is claimed is:

1.   A method of processing a packet, comprising:
translating Internet Protocol (IP) addresses located in a payload of the packet
if at least one of a source address and a destination address located in a packet header has
been previously translated.

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2.   A method according to Claim 1, wherein translating IP addresses is
preceded by:
receiving a packet at a network address translator (NAT) device;
determining if at least one of the source address and the destination address located in
the packet header has been previously translated to a normalized IP address; and
searching the payload of the packet for IP addresses if it is determined that at least one
of the source address and the destination address located in the packet header has been
previously translated;
wherein translating IP addresses comprises replacing at least one occurrence of an IP
address located in the payload of the packet.

3.   A method according to Claim 2, wherein determining if at least one of
the source address and the destination address located in the packet has been previously
translated comprises:
identifying the source address and the destination address in the packet header; and
determining if at least one of the source address and the destination address is present
in a set of translation rules;
wherein at least one of the source address and the destination address has been
previously translated if it is determined that at least one of the source address and the
destination address is present in a set of translation rules.

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4.   A method according to Claim 3, wherein searching the payload of the packet for IP addresses comprises:

identifying an occurrence of an IP address in the payload of the packet;

determining a corresponding normalized IP address for the occurrence of the IP address using the set of translation rules that the at least one of the source address and the destination address was determined to be present in; and

repeating the identifying and determining for each occurrence of an IP address in the payload;

wherein translating IP addresses comprises replacing at least one occurrence of an IP address located in the payload of the packet with the corresponding normalized IP address.

5.   A method according to Claim 3, wherein determining if at least one of the source address and the destination address located in the packet has been previously translated further comprises:

determining if at least one of the source address and the destination address is present in a header translation set of translation rules if it is determined that at least one of the source address and the destination address is present in the set of translation rules;

wherein at least one of the source address and the destination address has been previously translated if it is determined that the source address and the destination address are not present in the header translation set of translation rules.

6.   A method according to Claim 5, further comprising:

translating at least one of the source address and the destination address located in the packet header if it is determined that at least one of the source address and the destination address is present in the header translation set of translation rules.

7.   A method according to Claim 5, wherein determining a corresponding normalized IP address comprises determining a corresponding normalized IP address for the occurrence of the IP address using the header translation set of translation rules.

8.   A method according to Claim 3, further comprising discarding the packet if it is determined that at least one of the source address and the destination address is not present in a set of translation rules and the source address and the destination address are not present in the header translation set of translation rules.

9.   A method according to Claim 3, wherein determining if at least one of the source address and the destination address is present in a set of translation rules further comprises:

determining if at least one of the source address and the destination address is present in a plurality of sets of translation rules; and

discarding the packet if it is determined that at least one of the source address and the destination address is present in a plurality of sets of translation rules.

10.   A method according to Claim 9, wherein determining if at least one of the source address and the destination address is present in a set of translation rules further comprises:

determining if one of the plurality of sets of translation rules is the header translation set of translation rules if it is determined that at least one of the source address and the destination address is present in a plurality of sets of translation rules; and

discarding the packet if it is determined that one of the plurality of sets of translation rules is not the header translation set of translation rules.

11.   A method according to Claim 3, wherein the set of translation rules comprises a list of each IP address that has been translated and a corresponding normalized IP address for each IP address that has been translated.

12.   A method according to Claim 11, wherein the set of translation rules comprises a first set of translation rules that correspond to a first customer and a second set of translation rules that correspond to a second customer.

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13.   A method according to Claim 12, wherein the set of translation rules that correspond to the first customer are unique with respect to the set of translation rules that correspond to the second customer.

5   14.   A method according to Claim 1, wherein the packet is a Simple Network Management Protocol (SNMP) packet.

15.   A method according to Claim 14, wherein each of the IP addresses are identified by a unique SNMP object identifier (OID) located within a Management
10   Information Base(MIB).

16.   A method according to Claim 1, wherein the at least one of the source address and the destination address located in the packet header is previously translated by a border firewall.

17.   A method according to Claim 1, wherein the at least one of the source address and the destination address located in the packet header is previously translated by a router.

18.   A method of processing a packet, comprising:
determining if at least one of a source address and a destination address located in a packet header is present in a set of translation rules;
searching a payload of the packet for IP addresses if it is determined that at least one of a source address and a destination address is present in the set of translation
25   rules; and
translating the IP addresses in the payload of the packet using the set of translation rules.

19.   A method according to Claim 18, wherein determining if at least one
30   of a source address and a destination address located in a packet header is present in a set of translation rules is preceded by receiving a packet at a network address translator (NAT) device.

20.   A method according to Claim 18, wherein translating the IP addresses comprises replacing at least one occurrence of an IP address located in the payload of the packet.

21.   A method according to Claim 18, wherein determining if at least one of the source address and the destination address located in the packet header is present in a set of translation rules comprises:

identifying the source address and the destination address in the packet header;

scanning the set of translation rules to determine if at least one of the source address and the destination address is present in the set of translation rules; and

determining if at least one of the source address and the destination address is present in a header translation set of translation rules if it is determined that at least one of the source address and the destination address is present in the set of translation rules;

wherein at least one of the source address and the destination address has been previously translated if it is determined that at least one of the source address and the destination address is present in a set of translation rules and that the source address and the destination address are not present in the header translation set of translation rules.

22.   A method according to Claim 18, wherein searching the payload of the packet for IP addresses comprises:

identifying an occurrence of an IP address in the payload of the packet;

determining a corresponding normalized IP address for the occurrence of the IP address using the set of translation rules that the at least one of the source address and the destination address was determined to be present in; and

repeating the identifying and determining for each occurrence of an IP address identified in the payload;

wherein the translating IP addresses comprises replacing at least one occurrence of an IP address located in the payload of the packet with the corresponding normalized IP address.

23.   A method according to Claim 22, further comprising:

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translating at least one of the source address and the destination address located in the packet header if it is determined that at least one of the source address and the destination address is present in the header translation set of translation rules.

5   24.   A method according to Claim 23, wherein determining a corresponding normalized IP address comprises determining a corresponding normalized IP address for the occurrence of the IP addresses using the header translation set of translation rules.

       25.   A method according to Claim 21, further comprising discarding the
10   packet if it is determined that at least one of the source address and the destination address is not present in a set of translation rules and the source address and the destination address are not present in the header translation set of translation rules.

       26.   A method according to Claim 18, wherein determining if at least one
15   of the source address and the destination address is present in a set of translation rules further comprises:
       determining if at least one of the source address and the destination address is present in a plurality of sets of translation rules;
       determining if one of the plurality of sets of translation rules is the header translation
20   set of translation rules if it is determined that at least one of the source address and the destination address is present in a plurality of sets of translation rules; and
       discarding the packet if it is determined that at least one of the source address and the destination address is present in a plurality of sets of translation rules and that one of the plurality of sets of translation rules is not the header translation set of translation rules.

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       27.   A method according to Claim 18, wherein the set of translation rules comprises a list of each IP address that has been translated and a corresponding normalized IP address for each IP address that has been translated.

30   28.   A method according to Claim 16, wherein the set of translation rules comprises a first set of translation rules that correspond to a first customer and a second set of translation rules that correspond to a second customer.

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29.   A method according to Claim 28, wherein the set of translation rules that correspond to the first customer are unique with respect to the set of translation rules that correspond to the second customer.

30.   A method according to Claim 18, wherein the packet is a Simple Network Management Protocol (SNMP) packet.

31.   A method according to Claim 30, wherein each of the IP addresses are identified by a unique SNMP object identifier (OID) located within a Management Information Base (MIB).

32.   A method according to Claim 18, wherein the at least one of the source address and the destination address located in the packet header is previously translated by a border firewall.

33.   A method according to Claim 18, wherein the at least one of the source address and the destination address located in the packet header is previously translated by a router.

34.   A system for processing a packet, comprising:
a first network address translator (NAT) device that translates at least one of a source address and a destination address located in a packet header; and
a second NAT device that translates Internet Protocol (IP) addresses located in a payload of the packet if at least one of the source address and the destination address has been previously translated by the first NAT device.

35.   A system according to Claim 34, wherein the second NAT device comprises:
a detector circuit configured to determine if at least one of the source address and the destination address located in the packet header has been previously translated to a normalized IP address; and

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a scanner circuit configured to search the payload of the packet for IP addresses if it is determined that at least one of the source address and the destination address located in the packet header has been previously translated;

a payload translator circuit configured to translate IP addresses by replacing at least one occurrence of an IP address located in the payload of the packet.

36.   A system according to Claim 35, wherein the detector circuit is further configured to:

identify the source address and the destination address in the packet header;

determine if at least one of the source address and the destination address is present in a set of translation rules; and

determine if at least one of the source address and the destination address is present in a header translation set of translation rules if it is determined that at least one of the source address and the destination address is present in the set of translation rules;

wherein at least one of the source address and the destination address has been translated if it is determined that at least one of the source address and the destination address is present in a set of translation rules and that the source address and the destination address are not present in the header translation set of translation rules.

37.   A system according to Claim 35, wherein the scanner circuit is further configured to:

identify an occurrence of an IP addresses in the payload of the packet;

determine a corresponding normalized IP address for the occurrence of the IP addresses using the set of translation rules that the at least one of the source address and the destination address was determined to be present in; and

repeat identifying and determining for each occurrence of an IP address identified in the payload;

wherein translating IP addresses comprises replacing at least one occurrence of an IP address located in the payload of the packet with the corresponding normalized IP address.

38.   A system according to Claim 36, wherein the second NAT device further comprises:

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a header translator circuit configured to translate at least one of the source address and the destination address located in the packet header if it is determined that at least one of the source address and the destination address is present in the header translation set of translation rules.

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39.   A system according to Claim 38, wherein the scanner circuit is further configured to determine a corresponding normalized IP address for the occurrence of the IP address using the header translation set of translation rules.

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40.   A system according to Claim 36, wherein the detector circuit is further configured to discard the packet if it is determined that at least one of the source address and the destination address is not present in a set of translation rules and that the source address and the destination address are not present in the header translation set of translation rules.

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41.   A system according to Claim 36, wherein the detector circuit is further configured to:

determine if at least one of the source address and the destination address is present in a plurality of sets of translation rules;

determine if one of the plurality of sets of translation rules is the header translation set of translation rules if it is determined that at least one of the source address and the destination address is present in a plurality of sets of translation rules; and

discarding the packet if it is determined that at least one of the source address and the destination address is present in a plurality of sets of translation rules and that one of the plurality of sets of translation rules is not the header translation set of translation rules.

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42.   A system according to Claim 36, wherein the set of translation rules comprises a list of each IP address that has been translated and a corresponding normalized IP address for each IP address that has been translated.

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43.   A system according to Claim 36, wherein the set of translation rules comprises a first set of translation rules that correspond to a first customer and a second set of translation rules that correspond to a second customer.

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44.   A system according to Claim 43, wherein the set of translation rules that correspond to the first customer are unique with respect to the set of translation rules that correspond to the second customer.

5   45.   A system according to Claim 34, wherein the packet is a Simple Network Management Protocol (SNMP) packet.

46.   A system according to Claim 45, wherein each of the IP addresses are identified by a unique SNMP object identifier (OID) located within a Management
10   Information Base (MIB).

47.   A system according to Claim 34, wherein the first NAT device comprises a border firewall.

15   48.   A system according to Claim 34, wherein the first NAT device comprises a router.

49.   A system for processing a packet, comprising:
        means for translating Internet Protocol (IP) addresses located in a payload of
20   the packet if at least one of a source address and a destination address located in a packet header has been previously translated.

50.   A system for processing a packet, comprising:
        means for determining if at least one of a source address and a destination address
25   located in a packet header is present in a set of translation rules;
        means for searching a payload of the packet for IP addresses if it is determined that at least one of a source address and a destination address is present in the set of translation rules; and
        means for translating the IP addresses in the payload of the packet using the set of
30   translation rules.

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51.   A computer program product for processing a packet, comprising:

a computer readable program medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code which translates Internet Protocol (IP) addresses located in a payload of the packet if at least one of a source address and a destination address located in a packet header has been previously translated.

52.   A computer program product for processing a packet, comprising:

a computer readable program medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code which determines if at least one of a source address and a destination address located in a packet header is present in a set of translation rules;

computer readable program code which searches a payload of the packet for IP addresses if it is determined that at least one of a source address and a destination address is present in the set of translation rules; and

computer readable program code that translates the IP addresses in the payload of the packet using the set of translation rules.

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